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COMMUNICATIONS TO THE EDITOR

The Acceleration of the Surface of a Falling Film

Scott Lynn

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Scriven and Pigford (2) estimated the acceleration of the surface of a liquid film emerging from the feed slot of a wetted-wall column and the effect on the rate of gas absorption of the shifting velocity profile within the film. The authors considered the case of a relatively wide, horizontal slot feeding a vertical column. They assumed that the acceleration of the surface layer of the film was due only to

gravity, neglecting the effects of surface tension and momentum transfer within the film. They then generalized their conclusions to cover all types of wetted-wall columns. It will be shown below that their results represent only an extreme limit, even for the special case which they treated. For the case of a column of the type described in reference 1, in which the slot width is of the same order as the steady state

film thickness and in which the slot is also vertical, data obtained in a model study indicate that the acceleration of the surface of the film takes place in a distance about an order of magnitude smaller than would be estimated from the authors' equation.

The sketch in Figure 1 indicates the generalized problem on which the model study was based. The fluid is in full parabolic (laminar) flow at the